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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/591,135	08/30/2006	Nobuo Itou	Q96029	7352

23373 7590 12/28/2007

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EXAMINER	
COLON SANTANA, EDUARDO	
ART UNIT	**PAPER NUMBER**
2837	

MAIL DATE	DELIVERY MODE
12/28/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/591,135	ITOU ET AL.	
	Examiner	Art Unit	
	Eduardo Colon Santana	2837	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-5 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-5 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 30 August 2006 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date 8/30/2006.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☒ Other: Detailed Action.

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on 8/30/2006 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Claim Objections

2. Claim 2 is objected as being indefinite and redundant for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 2 describes having two d-axis current generating means having two different functions which create a redundant, unclear depiction of the subject matter which applicant regards as the invention. Is it unclear if the two d-axis current generating means mentioned in the claim are the same.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any

evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable and obvious over Atarashi U.S. Patent No. 6,700,400.

Referring to claim 1, Atarashi discloses a constant detecting apparatus (15) for a synchronous motor (see all figures and respective portions of the specification). Further, Atarashi depicts from figures 1 or 2, an inverter (13); a q-axis current instruction means (25) and a d-axis current generating means (24). Furthermore, Atarashi describes a loss calculation means (27) (see figures 4 and 5B and Col. 20, line 57 to Col. 21, line 45) for calculating a loss of the motor's copper loss and iron loss. Moreover, Atarashi describes a detecting unit (26) that detects various signals (see Col. 18, line 57 to Col. 19, line 10), including a signal of the power source voltage V_{dc} output from the power source (14). However, Atarashi does not explicitly describes that the detection signal of the power source voltage output is for judging whether or not the motor is operating in a recovery state to thereby activate the d-axis current generating means. Nonetheless, one of ordinary skill in the art would recognize that synchronous motors operate in different manners (i.e. dynamic mode and

regenerative (recovery) mode). Therefore, it would have been obvious that if a power source voltage output signal is being detected as taught by Atarashi, one of ordinary skill in the art would have the necessary data to judge if the motor is in a recovery (regenerative) state or dynamic state, since the power supply would be in a discharge mode if in a dynamic state or it would be in the charged mode if in a recovery (regenerative) state. One of ordinary skill in the art would also recognize that the activation of the d-axis current generating means is obvious in the recovery state since the d-axis current is preferably as small as possible, because if the d-axis current in an amount exceeding an indispensable amount is supplied to the synchronous motor, then the copper loss would increased and the efficiency of the synchronous motor would deteriorate.

As to claim 2, Atarashi addresses the similar limitations of claim 1 above, in addition discloses having a storage means (28); a current detecting means (47); a position detecting means (43) and a calculating means (27) for calculating a loss based on the current detection signal and the winding resistance (Ro), the motor's copper loss, and calculating based on the position detecting means and the field magnetic flux and the motor iron loss (see figures 3-5B, and Col. 20-23).

Referring to claim 3, Atarashi addresses the similar limitations of claims 1 and 2 above, in addition depicts from figure 3 a rotor temperature sensor (44) that detects the motor temperature (Tmag) and

winding temperature sensor (45) that detects the winding temperatures (T1,… Tn) and a calculating (estimating) means (27) that estimates temperature rise in the motor winding (T1,…Tn) based on the loss calculated and on the thermal time (Tmag) (see Col. 3, lines 30-35; Col. 20, lines 18-35).

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Atarashi in view of Kato U.S. Patent No. 6,541,937.

Referring to claim 4, Atarashi addresses all the limitations of claims 2 or 3 above, but does not explicitly describes having a d-axis current limiting means. Nonetheless, Kato describes a motor control device with vector control functions having a d-axis current limiter (21)(see figures 3,7-9, Summary of the Invention and Col. 4). It would have been obvious to one of ordinary skill in the art at the time of the invention to add a current limiter as taught by Kato within the teaching of Atarashi for limiting the d-axis current to the maximum current an inverter is capable of flowing in the case there is a sudden change in load capacity by the motor to provide a security measure that would restrict the excess flow that would cause an overload in the system and damage the motor or the inverter.

4. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Atarashi in view of Kumar U.S. Patent No. 6,591,758.

Referring to claim 5, Atarashi addresses all the limitations of claims 2 or 3 above, but does not explicitly describes or show having a recovery (regenerative) consumption means that includes a resistor

and a switching device and an activation means that judges whether or not a direct voltage exceeds a predetermined threshold value. On the other hand, Kumar discloses a hybrid energy electrical power storage system (see figures 1B and 9A) having a recovery consumption means (110) that includes resistors and switches (DB1-DB5) and in figures 4 and 5, shows means (402) as an excess option that controls (judges) if there is an excess of regenerative voltage to thereby activate the switching device to either switch on or off (see Col. 8, line 65 to Col. 9, line 32). It would have been obvious to one of ordinary skill in the art at the time of the invention to include a resistor bank (recovery consumption means) with activation means that judges the excess voltage as taught by Kumar within the control system of Atarashi for the purpose/advantages that during a regenerative mode, the excess energy can be routed to a resistor for dissipation as heat energy and when there is more energy (regenerative voltage) than needed, have the means to stop the routing to the resistor and store it at a different storage location for further usage without excess waste of energy.

Conclusion

5. The prior art made of record in form 892 and not specifically relied upon are considered pertinent to applicant's disclosure to further show the state of the art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eduardo Colon

Santana whose telephone number is (571) 272-2060. The examiner can normally be reached on Monday thru Friday 7:00am - 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lincoln Donovan can be reached on (571) 272-2800 X.37. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Eduardo Colon-Santana
Patent Examiner
Art Unit 2837

/ECS/
December 21, 2007